

Features

- Performs Thin-Layer Chromatography (TLC) using an appropriately shielded high-resolution NaI detector
 - Performs both: chemical purity analysis through TLC scanning and radionuclide purity analysis by means of energy spectrum analysis (also known as pulse height analysis – PHA)
 - Allows automatic storing of PHA spectra together with the chromatogram spectrum (scan)
 - Full hardware control (both scanner and data acquisition system) via software
 - Scan can be performed under manual control as well
 - Complete and comprehensive software package with “Protocol-driven” measurements, for best reproducibility and quality control
 - All measurements and parameters are stored into a database. A specialized data review program is included in the standard software package
 - Windows® 2000 and XP platforms supported
- The *iScan* is only for sale in Benelux and Denmark.

iScan An Intelligent TLC Radiochromatography Instrument

Description

The *iScan*, is an intelligent radiochromatography instrument, that uses Radioactive Thin-Layer Chromatography (TLC) a well-established analytical technique used to identify components in a mixture. It is widely used in Nuclear Medicine laboratories to control the compounding and dispensing of radioactive pharmaceuticals used in nuclear medicine procedures. The technique is used as well by producers of radiopharmaceuticals, where quality of the production must be monitored continuously.

Today, a radiochemical purity control is absolutely essential to ensure the accuracy of the radiopharmaceutical-based medical analysis.

At the same time the radionuclide purity of the radiopharmaceutical is a warranty of its efficiency and quality.

This instrument targets the control and measurement of both characteristics of the radiopharmaceuticals.

***iScan* COMPONENTS**

The *iScan* instrument is supplied with the following components:

Hardware Components

- The programmable scanner
- A NaI scintillation detector with suitable shielding and set of collimators
- A compact multichannel analyzer (MCA)
- The controlling PC (optional)

Software Components

The *iScan* software package contains three modules:

- *iScanDB*, a database manager
- *iScan*, the main Chromatography software
- *iScanReviewer*, for data review and analysis

The *iScan* software package has been designed to automate the TLC analysis, particularly Medical Chromatography.



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HARDWARE DETAILS

TLC Scanner

The *i*Scan scanner is a fully-programmable instrument. Its main function is to sweep the detector across the chromatogram strip.

The scanner's programmable motor allows several scanning speeds, including user defined ones.

Parking of the detector, advancing to the startup position and returning to the home position are done automatically under software control. A Reset button in the front panel is provided so the user can manually abort the scanning operation at any time.

The place that holds the strip is engraved in the base of the scanner plate and is 5 mm deep, 50 mm wide and 210 mm long (0.2 x 2.0 x 8.3 in.). There is a convenient ruler placed along the scanning length.

The communication with the PC is done via a RS-485 interface (a RS-485 to RS-232 converter is provided) using a standard 9-pin connector located in the back of the device.

The power supply socket is also located in the back, the scanner works directly from 100–240 V ac mains.

The On/Off switch is located at the top-right corner of the front panel of the scanner, a built-in LED signals the power-on status.

There is also a Manual scan button. It allows executing a complete scan operation using a single speed fixed at the factory, without the need of the controlling PC.

For additional details, see the "Specifications" section in this document.

Nal Detector

The *i*Scan is offered with a high-resolution NaI scintillation detector having (standard option) a crystal of (typically) 2 x 2 in. This detector provides excellent energy resolution and counting efficiency. Other sizes can be arranged upon request.

The detector is mounted inside a shielding housing made of lead that is 10 mm (0.4 in.) thick on its thinner part. The front area of the detector is collimated using a standard 1 mm (0.04 in.) aperture.

Collimators of different apertures can be easily mounted in the scanner. Another collimator of 3 mm (0.2 in.) opening is delivered with the instrument.

MCA

The data acquisition system makes use of CANBERRA's compact Multi-Channel Analyzer, **uniSPEC**.

This MCA can operate in two different data acquisition modes: Pulse-Height Analysis (PHA) and Multi-Channel Scaling (MCS). The first mode is used by *i*Scan to acquire the energy spectrum of the radiopharmaceutical or sample being scanned, while the second is used to generate the actual chromatogram during the scan.

The MCA is built inside the 14-pin socket that is connected to the NaI detector, providing a compact and light assembly. The MCA communicates with the controlling PC via any available USB port.

The MCA can be set-up to acquire a maximum of 1024 channels. The Dwell times may range from a few ms to minutes. The MCA acquisition parameters for both PHA and MCS modes can be set via the software from the controlling PC.

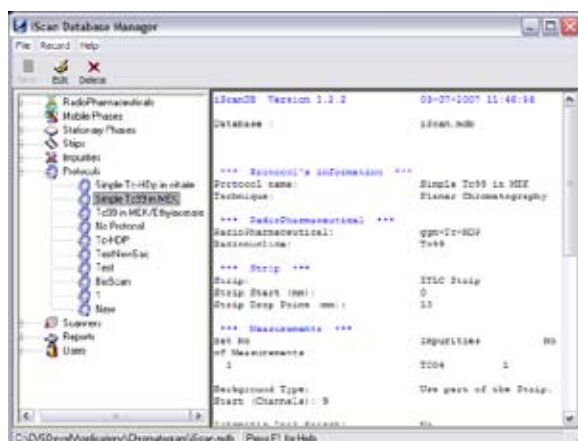
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SOFTWARE DETAILS

The software consists of the following modules:

iScanDB

The iScan measurements are “Protocol driven”. All the parameters that make up a Protocol, the set of different Protocols and the results of all measurements are stored in a relational database.



iScanDB is the program that manages and organizes the database.

iScan

iScan is the main program used to perform the Chromatography analysis based upon the Protocols previously created.

The program automatically controls the scanner and data acquisition, performs the data visualization and analysis of Chromatogram spectra (MCS) and, if selected, the energy spectra (PHA). The storage and logging of the analysis results into the database is done in unattended mode.

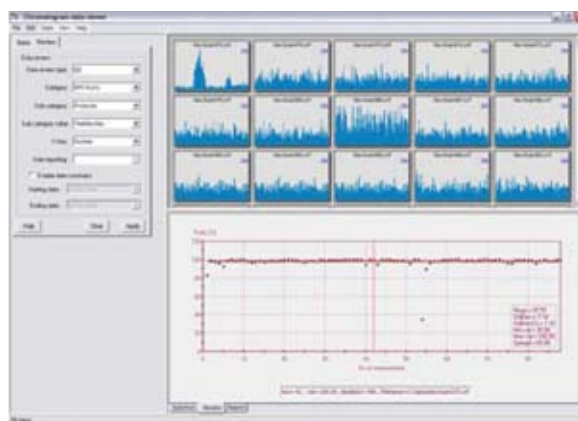


iScanReviewer

Provides the necessary tools for data extraction, visualization, manipulation and reanalysis of all chromatogram scans (files) stored into the database and PC.

iScanReviewer can produce Quality-Control (QC) charts (also known as trending charts) for the measured chromatogram scans of a given Protocol (or other database fields) using several qualifiers (Purity, Rf, Peak area, continuum values, etc.). Date constraints can be specified as well.

With this program, stored chromatogram scans (files) can be re-viewed, re-analyzed or reported.



Statistical analysis of QC results can be performed among many other data operations.

Data can easily be exported to ASCII, CVS, XML files or directly into Microsoft® Excel.

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Specifications

TLC SCANNER

- MODEL – iScan-TLC101.
- DIMENSIONS – 37 x 22 x 25 cm (14.6 x 8.7 x 9.8 in.) (W x H x D).
- WEIGHT – 16.5 kg (36.4 lb) (without detector and MCA).
- POWER SUPPLY – 100–240 V. 50/60 Hz.
- FUSES – 250 V T2A soldered fuse.
- SCAN AREA – Strips max 50 x 210 mm (2.0 x 8.3 in.).
- SCAN SPEED –
 - Automatic.
 - 0.1 to 2 cm/s (0.04 to 0.8 in.) Software Selectable.
 - Fixed to ~0.5 cm/s (0.2 in.) when using Manual scan mode.
- SCANNER CONTROL – via RS-485/RS-232 protocol.
- STRIP CARRIER –
 - One provided, 50 x 200 mm (2.0 x 7.9 in.) engraved in plastic. Extra pieces can be provided upon request and at extra cost.
 - Metallic ruler (0–240 mm) (0–9.4 in.) mounted along the scanning path.
- FRONT SWITCHES, BUTTONS AND LEDs –
 - On-Off switch with LED power-on indicator.
 - Manual scan push-button.
 - Scanner reset push button.
 - Blue LED signaling Busy state.
- BACK CONNECTORS –
 - 3-contact standard 100–240 V mains socket.
 - 9-pin RS-485/RS-232 connector.
- SHIELDING – 10 mm (minimum) of lead (Pb) around the detector.
- EXTRAS –
 - EU (220 V) power cord.
 - RS-232/RS-485 data cable (RS-485 to RS-232 adaptor optional).

DETECTOR

- TYPE – NaI scintillation detector.
- DETECTABLE RADIATION – Photons: Gamma-rays and X-rays.
- DIMENSIONS – Typically 2 in. x 2 in. standard crystal. Other sizes can be ordered at an additional price.
- TYPICAL ENERGY RESOLUTION – 8–7.5% at 662 keV.
- COLLIMATORS – Set of two collimators of 20 mm-thick (0.8 in.) Pb with apertures of 1 mm and 3 mm (0.04 and 0.12 in.).

SPECTROMETER

- MCA TYPE – CANBERRA's uniSPEC compact MCA as standard option. Other **CANBERRA** acquisition systems are also supported.
- ACQUISITION MODES –
 - PHA (1024 channels).
 - MCS (1024 channels).
- DWELL TIMES – From 0.1 s to 255 s, software selectable.
- DATA COMMUNICATION – USB.

Computer

- Desktop PC compatible system with the following minimum requirements –
 - 100 MHz Pentium®.
 - 16 MB RAM.
 - One Serial port RS-232.
 - One free USB connection.
 - Windows 2000 or Windows XP.

Software

- iScan version 1.2; includes the following modules –
 - iScanDB.
 - iScan.
 - iScanReviewer.
- Supplied in CD-ROM together with User's Manual.

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